

3.4 Solutions for Systems of Equations! NOTES KEY

Solutions for 2 equations 3 possibilities.

I Intersect in 1 pt.

A. (a) \perp
(b) oblique } consistent
 independent

B. \parallel ; no solution; inconsistent

C. same line infinite solutions
then coincident.

III 3 ways to solve

A. By graphing using $y = mx + b$!

B. Substitution: (middle section)/3

eg: $x + 4 = -11 \Rightarrow x = -15$

$$\begin{array}{r} 2y + x = 1 \\ 2y + (-15) = 1 \\ 2y = 16 \\ y = 8 \end{array} \quad \boxed{(-15, 8)}$$

$$\begin{array}{r} 7m - 6n = 18 \\ 3n + 9 = \frac{7}{2}m \\ 6n + 18 = 7m \quad \times 2 \\ 7m = 18 + 6n \end{array} \quad \begin{array}{r} \frac{5}{2}x - y = 9 \\ 5x - 2y = 15 \\ 5x - 2y = 18 \end{array} \quad \begin{array}{l} \times 2 \\ \text{SAME LINE} \\ \text{INFINITELY MANY SOLUTIONS} \end{array}$$

SAME SLOPE so \parallel \emptyset

C. Elimination: (best in standard form) [last section]

eg: $12x - 2y = 10$
 $+ \quad -6x + 2y = 14$
 $6x = 24$
 $x = 4$ $\boxed{(4, 19)}$

$$\begin{array}{r} 3a = 16 - 4b \\ 6a + 4b = -2 \\ -3a + 4b = 16 \\ 3a = -18 \\ a = -6 \\ 3(-6) + 4b = 16 \\ -18 + 4b = 16 \\ 4b = 34 \\ b = \frac{17}{2} \end{array} \quad \boxed{(-6, \frac{17}{2})}$$

$-6(4) + 2y = 14$
 $-24 + 2y = 14$
 $2y = 38$
 $y = 19$